

PN-ABI-548

PROGRAM OF DEVELOPMENT STUDIES
121 Cleveland Sewall Hall
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Houston, Texas 77001

Vocational Improvement Centres: A Successful...

NI NTIS
374.013 Rice Univ. Program of Development Studies.
R576 Vocational Improvement Centres: A Successful
WVdb ful Nigerian Experiment. Gaston V. Rimlinger
and Carolyn Stremlau. 1972.
ISN=18018 24 p.
PG28 Contract AID/csd-3302.

1. Vocational education - Nigeria. 2. Industrial
training - NI. 3. Educational development - NI. I.
Contract. II. Rimlinger, Gaston V. II. Stremlau,
Carolyn. III. Title.

Paper No. 18

VOCATIONAL IMPROVEMENT CENTRES:
A SUCCESSFUL NIGERIAN EXPERIMENT

by

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Spring, 1972

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Vocational Improvement Centres: ¹
A Successful Nigerian Experiment

This article describes a practical, low-cost approach to the training of craftsmen. It has been very successful in Nigeria and can be easily adopted in other developing countries. An attempt is made in the article to compute the economic value of the training programme.

1. The Training Problem

Nigeria has made remarkable progress since independence in engineering and technical education. The emphasis, understandably for a rapidly developing economy, has been on the education of engineers and to a lesser extent on the training of technicians. These are levels of training which usually require a post-primary level of education.

Formal vocational education in Nigeria takes place almost exclusively at the secondary level. Only a few primary schools offer pre-vocational training. In the early 1960s, craft schools in the former Northern Region provided three-year pre-vocational courses at the primary level, but these are now being upgraded to post-primary institutions. The schools are responding to the pressures to prepare the pupils for trade schools. In the rest of the country, the lowest level of formal

¹The authors wish to pay tribute to the late Dr. Adam Skapski who was responsible for the conception and establishment of the first pilot centre. They wish also to express their gratitude to Mr. William Gardner and Mr. William Hamper, the project specialists in charge, for their cheerful cooperation in gathering data on the programme. The other main sources of information were first-hand investigation and the files of the Lagos Office of the Ford Foundation.

vocational or technical training is already the trade school, with entrance requirements of two or three years of secondary school. The more able among the trade school students do not look upon their training as a step toward an industrial career but as a step toward university training in engineering.

The general aspiration and drive toward higher formal qualifications leaves the training of the skilled artisan or craftsman in a rather neglected position. The way of acquiring skills at this level remains essentially the apprenticeship system. In a developing country like Nigeria, this system, as it exists today, has serious drawbacks. For the system to be effective, the master craftsmen have to be well trained themselves and have to possess a level of education sufficient to impart the theoretical principles underlying their trade. While this may be the case in the larger enterprises of the modern sector, it is rarely the case in small enterprises.

The mass of the "masters" in small industries, such as cabinet making, metal working, auto repairing, plumbing, construction, bricklaying, welding, and electrical contracting, have only a rudimentary level of training and education. This is especially the case with regard to modern tools and techniques. Such "masters" as a rule take on rather more "apprentices" than they could effectively train. The apprentices, like their masters, tend to have little or no formal education. They receive very low or no wages (they may get pocket money), and sometimes they have to make payments to their masters. At the end of several years of "training", the apprentices may receive some kind of certificate from their master, but this has no generally recognized status.

At the end of an apprenticeship lasting a variable number of years, the apprentice in a small enterprise often finds that his master cannot offer him employment as a regular wage-worker. He must thus find employment elsewhere, but his chances on being hired as a skilled craftsman are very slim: he is not well trained, nor does he have a recognized trade certificate.

It is true that a few of the larger technical schools and trade centres in the larger towns do offer evening courses, but these do not serve the needs of the class of artisans that are discussed here. These evening courses are designed to prepare trainees for the London City and Guilds certification, which requires a higher level of basic education than that possessed by the mass of Nigerian artisans and small entrepreneurs. Another obstacle for them is the enrolment fee, which is burdensome even if it is modest.

2. Origins and Growth of the Centres

The Vocational Improvement Centres were established to deal with the two serious shortcomings noted above: inadequate training of artisans and lack of certification. The centres provide both shop and classroom training for artisans with little formal education and prepare them for the Nigerian Federal Ministry of Labour Trade Tests.

These centres were first started in Northern Nigeria, because this area lags considerably behind the South in levels of education and industrialization. Since the 1950s efforts have been underway by the Governments of the Northern Region, the States, and the Federation to take steps to enable the North to catch up with the rest of the country. By the mid sixties these efforts included attempts to spread the development of small

scale industries. The Industrial Development Centre at Zaria and the Small Industries Credit Scheme were part of these efforts.

It was realized early, however, that one of the main handicaps to the growth of small scale indigenous industry was the serious shortage of trained craftsmen. The Industrial Development Centre was designed in part to deal with this problem, but one centre could not possibly do all the needed training, and most workers and small employers could not afford to leave their jobs to attend even the short courses given at the Zaria Centre.

The Government of the Northern Region thus approached the Ford Foundation in late 1964 with a request for assistance in the training of indigenous entrepreneurs in the Kaduna area. The Foundation agreed to organize and finance a pilot centre which would offer evening courses in general education and in workshop training free of charge to indigenous businessmen and their apprentices. The Business Apprenticeship Training Centre (B.A.T.C.) opened its doors in February 1965 with a group of trainees that were to be prepared for the Federal Ministry of Labour Trade Tests.

The success of the B.A.T.C. led the Council for Vocational and Technical Training of the Northern Region to recommend in 1967 the establishment of six additional centres in other parts of the Northern Region. The Council also recommended that training be made available to workers in Government and larger scale private industries and that the new centres be called Vocational Improvement Centres to indicate the wider scope of training being offered.

With the creation of states in May 1967, the programme was extended

to allow for two VIC's in each of the six northern states. By June 1971 all twelve centres had been established as indicated in Table 1.

TABLE 1: Vocational Improvement Centres
in the Northern States

<u>LOCATION</u>	<u>DATE OF ESTABLISHMENT</u>
North Central State	
Kaduna (B.A.T.C.)	February 1965
Katsina	July 1967
Kano State	
Kano	April 1968
Kano	June 1971
North East State	
Maiduguri	April 1968
Bauchi	April 1970
North West State	
Sokoto	January 1968
Minna	May 1969
Benue-Plateau State	
Jos	May 1967
Makurdi	February 1971
Kwara State	
Ilorin	February 1968
Lokoja	March 1971

Between 1965-66 and 1970-71 over 2,000 trainees attended courses at these centres.

TABLE 2: Growth of Enrolment

<u>Year</u>	<u>No. of trainees</u>	<u>No. of Centres operating</u>
1965-66	54	1
1966-67	67	1
1967-68	165	4
1968-69	491	7
1969-70	553	8
1970-71	<u>699</u>	9
Total	2,029	

There is considerable variance in the size of the centres depending upon the number of trades taught. The 1970-71 enrolment breaks down as follows:

TABLE 3: 1970-71 Enrolment

<u>Centre</u>	<u>No. of trainees</u>
Kaduna (B.A.T.C.)	82
Katsina	40
Kano (No. 1)	171
Jos	128
Maiduguri	78
Bauchi	44
Sokoto	37
Minna	52
Ilorin	<u>67</u>
TOTAL	699

During the 1971-72 session the remaining three centres (Kano, No. 2, Lokoja, and Makurdi) will be in full operation. Total enrolment in future years will probably be between 800-1,000 trainees per session.

The 1967 decision of the Council for Vocational and Technical Training to open enrolment to government and industrial workers has in practice resulted in only a slight modification in the original aim of upgrading trade skills in the indigenous business sector. The emphasis of the programme continues to be on the small artisan.

The Council argued that there was no opportunity available for workers in government or industry to improve their skills or to gain trade certification and that they should, therefore, be considered eligible for VIC training. Employers rarely offer the type of training which would enable the unskilled or semi-skilled worker to gain certification. Like the entrepreneurs and apprentices in the small industry sector, most of these

workers have too low an educational level to benefit either from available part-time courses or to prepare for trade tests on their own.

In retrospect, it can be said that this decision to broaden the base of trainees has added a useful degree of flexibility to the programme. Most centres are located in cities where there is a local business community of sufficient size to support a VIC. In these centres (e.g. Kaduna, Jos, Ilorin, Maiduguri), a large number of the trainees will continue to be from small indigenous businesses. With the establishment of two VIC's in each state, however, it has in some cases been necessary to locate a centre in a town where the number of local businessmen is at the present time insufficient to fill the classes. In these locations (e.g. Sokoto and Katsina), employees from government departments such as Public Works Department, Electricity Corporation of Nigeria, the Ministry of Agriculture, and local government authorities, together with employees of larger industrial firms are admitted.

While each centre is expected to give preference in enrolment to entrepreneurs, there are no set quotas as to the ratio of self-employed artisans to industrial or government workers. The only guideline is that large industries should not be allowed to monopolize courses. This problem became serious in one case, but it was dealt with effectively.

Kaduna, for instance, is a city with a large industry, textiles, capable of monopolizing a VIC. This situation has been avoided, however, by a continuous effort to make the small businessmen and their apprentices aware of the course opportunities. Textile company employees (of whom there are some 15,000 in Kaduna) account for only 10-15% of enrolment.

Kano offers an illustration where the flexibility offered by admitting

government and industrial workers has been important. In Kano most of the VIC enrollees are employees of medium-sized expatriate-owned businesses or of government departments. This special situation has arisen from the urgent need to train many local people who have stepped in to take over skilled jobs vacated by Easterners who left following the 1966 disturbances.

In 1971, as the original 12 centres in the Northern States were completed, plans were readied to establish similar centres in the Mid-West, South-East, Rivers, and East Central States. The Ford Foundation is lending its assistance for the establishment of two centres in each of these States. The Western and Lagos States have not been included in this programme since they already have their own programmes of vocational training.

3. Organization of the Centres

A fundamental aim of the organizers of this programme has always been to keep it simple, inexpensive, and closely adapted to the needs and resources of the area to be served. The first step in the establishment of a centre is the choice of an appropriate location. This is the responsibility of the State Ministry of Education. The suitability of a location is determined primarily by the number of potential clients in the immediate area, which may require a sample survey. One should expect that political factors also enter into consideration, but so far the locations of the Nigerian centres have been wisely chosen.

Once the site has been designated by the Ministry, a search is made for suitable premises. The establishment of a VIC involves no capital construction. Trade classes are held in existing workshops of a trade or craft school if there is one in the city, or in workshops of the Ministry of Works or Local Authority. General education classes are held in a

local school. Since VIC courses are held in the evening there is no conflict with the usual occupants of either the workshops or classrooms.

Usually the VIC will undertake minor modifications in the workshops to adapt them for its needs. It may build cupboards in which to store tools, construct additional work benches, or install blackboards. No major alterations are undertaken. The only other capital expenditure involved is for tools and minor equipment. The VIC makes use of large machines such as lathes already at the workshop, but each centre purchases its own supply of hand tools for use by the trainees. Each trainee is issued his own set of tools, which are locked in storage when not in use.

Once facilities have been procured and equipped, instructors for both the trades and general education classes are recruited. All VIC staff are contracted on a part-time basis. Trade instructors are recruited preferably from local trade or craft schools. If there is no school in the area, qualified tradesmen, either from government workshops or private industry, are engaged. To teach the general education subjects, local teachers (with at least Grade II and preferably Grade I teaching qualification) are hired. The pay - 30 shillings per hour - is sufficiently attractive that there has been no difficulty recruiting either type of instructor.

The advantages in using part-time local instructors are two-fold:

- (1) It eliminates the expense of paying salaries for full-time employees; and
- (2) The teachers, being from the area, are familiar with the local situation and needs. Furthermore, they are able to explain material in the vernacular when necessary.

Supervisors are also appointed on a part-time basis. For each centre,

in addition to the chief supervisor (often the principal or other official of the trade or craft school), one of the teachers serves as supervisor of the trade section and another as supervisor of the general education section. They are paid £8 per month above their teaching remuneration.

A storekeeper, generally the storekeeper of either the trade or craft school or the government workshop where classes are held, is appointed for each centre. He is paid on a part-time basis at overtime rates.

The manpower - all part-time - required for a centre which offers four trades is therefore:

- 1 Chief supervisor
- 4 trade instructors (one of whom also serves as supervisor)
- 4 general education teachers (one of whom also serves as supervisor)
- 1 storekeeper.

4. Recruitment of Students

The training is offered free of charge, which facilitates the selection of candidates in line with the objectives of the programme. The purpose of the programme is to upgrade the skills of those practising a trade, not to develop vocational skills among the unemployed. The major criterion for acceptance is therefore that an applicant must have been working at his trade for at least one year, and preferably two. They do not have to forego earnings to take the course.

Potential candidates find out about the courses through advertisements distributed in the target area. Unless it is the first course to be offered,

word of mouth, originating from previous participants, has been the most effective means of advertisement. Applicants are required to fill out a simple form stating employment, job experience, state of origin, age, and education.

At most centres the number of applicants far exceeds the number of available places. As a further screening step, all applicants are interviewed and asked to perform simple technical tasks related to their trades. Those who appear to have had only limited trade experience are asked to re-apply the following year.

Most trainees are between the ages of 20 and 30. The minimum age accepted is 16 years and while there is no maximum age, it is preferred that trainees be under 40 since it is felt that it is more difficult to teach new methods to older artisans.

Since there is no minimum educational requirement, educational backgrounds vary widely. In Kaduna, the majority of trainees have had seven years of primary education. A few have had no exposure to formal education, but some have had several years of secondary education. This is likely to be the situation also in the more southern-located centres, such as Jos, Ilorin, Makurdi and Lokoja, where educational enrolment is higher than in the far Northern cities. In Katsina, Sokoto and Maiduguri, the number of trainees with primary schooling is much lower than elsewhere.

The number of trainees varies from centre to centre depending on the number of trades offered. The general guide-line is to admit 18 students per trade. Allowing for some wastage, this usually results in an enrolment of approximately 15 students per trade. If a student drops out during the first one or two months, his place can be filled by a new trainee.

After that, it is considered too difficult for a newcomer to catch up with the class. It is worth noting that the programme has suffered remarkably little from drop-outs.

Experience has shown that the employment requirement for trainees should be waived under special local circumstances. Kaduna, for instance, each year admits a group of school leavers to a special two-year course. This was begun in an effort to train people to fill the gap left by the exodus of the Ibos in 1966. Some tradesmen, such as electricians and plumbers, were in particularly short supply and it was decided that the VIC should conduct courses in these trades. Efforts are made to place these trainees after the completion of their course. Following the initiative taken by Kaduna, a few other centres have occasionally admitted unemployed boys to study trades in which local artisans were in short supply. In general, however, this is avoided largely because it is feared that in smaller cities there simply would not be sufficient employment opportunities for the trainees.

5. The Instructional Programme

As indicated earlier, the programme of each centre includes both workshop training and classroom education. A cycle of courses lasts ten weeks, at the end of which the trainees present themselves for the trade tests. Classes meet for two hours four days a week, after working hours. Two days are devoted to general education and two days to workshop training. Each cycle thus comprises 160 hours in the classroom and 160 hours in the workshop.

The particular trades offered at a given centre depend on (1) local demand; and (2) availability of instructors. Each centre is started with

a minimum of four "core" courses: auto repair, carpentry and furniture making, brick laying and masonry, and electrical wiring. Both Kano and Jos are now offering nine courses, Kaduna offers eight and the other VIC's four to six.

In addition to the four "core" courses, training is offered at various centres in the following trades:

1. General fitting
2. Plumbing
3. Leatherwork
4. General welding
5. Painting and signwriting
6. Technical drawing

Each instructor is expected to cover the material outlined in the VIC syllabus for his trade. Syllabi for each trade were drawn up in 1969 by a group of representatives from the then-existing seven VIC's together with outside consultants. The syllabi are based on the requirements for the Ministry of Labour Trade Tests, Grades III, II, and I.

The trade classes include both practical workshop instruction and an introduction to the principles involved in the respective trades. A trainee preparing for the Grade III test (the first qualification) concentrates on improving his mechanical skills, while the Grade I (the most advanced level) applicant spends more time on learning trade principles than in actual workshop techniques. At this level the training includes also management practice.

General education classes in which English and trade-related mathematics are taught are an integral part of VIC training. The carpenter who is unable to read a measure or the motor mechanic unable to write out a bill is

not uncommon. For the self-employed, a working knowledge of English and simple mathematics can be an important factor in determining his ability to improve the quality of his work or to expand his operations. For the government or industrial worker, it may determine his chances for advancement.

Trainees are divided into groups according to educational level - those with no formal schooling, those with some primary schooling, and those who have completed primary school (and possibly some secondary training).

For English classes, trainees are placed together regardless of trade, but for mathematics classes trainees from related trades are usually placed together so that the teaching can concentrate more fully on mathematics related to particular trades. In both English and mathematics, emphasis is placed on relating instruction to the trade.

Some of the centres located in areas which have a considerable number of self-employed businessmen (e.g., Maiduguri, Jos, and Kaduna) have introduced instruction in simple bookkeeping. These classes are offered in addition to the regular four weekly sessions and usually meet on Wednesday evening for two hours, giving a total of eighty hours of instruction over the ten-month period.

6. Performance Tests and Incentives

The VIC programme has a built-in performance test in the form of the Federal Ministry of Labour Trade Tests. Since there are financial rewards, in the form of higher wages, associated with successful passing of these tests, the trainees have every incentive to perform to the best of their ability. Yet, incentive is provided not only for good test performance,

but also for good overall performance during the course. This incentive comes in the form of valued prizes, which are awarded upon graduation.

At the end of the ten-month course the VIC supervisor arranges for the trainees to take the trade tests. Only the names of those with regular attendance record and good performance reports are submitted. The VIC pays the registration fee for each trainee (£1 for Grade III, £1.10 for Grade II and £2 for Grade I). It covers also the cost of 3 photographs required to register for a test.

The Ministry of Labour trade testing system is particularly well suited for the VIC program. The emphasis at all three levels is on practical skills, with minimal formal educational requirements.

To sit for the Grade III exam it is not necessary that a trainee be able to speak English. Arrangements can be made for the test to be taken in a vernacular language. Grade II and Grade I qualification however, do require facility in the English language. It is felt that a person with this level qualification is likely to be in a supervisory position and should be able to conduct business in English.

Approximately 60% of the trainees pass the trade test the first time. If a trainee fails, he can sit the exam again after six months. Virtually all those who try a second time are successful.

Most of the trainees so far have prepared for the Grade III test. Only a few of the larger and older centres have as yet offered syllabi for Grade II and Grade I. Since most of the VIC's have been established within the past two or three years, it is too early to estimate what the demand for advanced courses will be.¹ If Kano is any indication, however,

¹A tradesman is required to have an additional year of work experience before applying for Grade II qualification and a further two years after Grade II before applying for Grade I.

the demand could be considerable: in 1969-70 over 50% of the enrollees were studying for the Grade II qualification. Most of these trainees previously had passed their Grade III at the VIC.

Each ten-month session is concluded with a prize-awarding ceremony attended by local dignitaries. Certificates are presented to each trainee who successfully completes the course. For the top two students in each trade group, there is a first and a second prize, which are based on workshop as well as classroom performance.

Each prize consists of a tool kit for that particular trade. The average value of the first-prize kit is £25. There is considerable variance: a carpenter's tool kit can run to £40, while an electrician's may cost as little as £8.

The awarding of prizes has proved to be an important aspect of the programme. Word of the prizes often travels faster and further than details of the courses! There is no doubt that the tool kits provide a strong incentive for both regular attendance and high performance.

7. Administration and Finance

The VIC's are administered by the Ministry of Education in each state. The first centre, the Kaduna B.A.T.C., was placed under the Ministry of Trade and Industry. It has remained under that Ministry's jurisdiction, yet maintains close contact with the North Central Ministry of Education.

General administration is handled by the state Area Inspector of Education who is expected to visit the centres periodically. Funds for the running of the centres are allocated by the respective Ministry of Education to the inspector who then buys equipment and tools on the application of the centre supervisor. The day-to-day operation of each centre

is handled by the part-time supervisor.

Under the agreement between the Ford Foundation and the Nigerian Government, the Foundation provides financing for the alteration or renovation of existing workshops, purchases the necessary tools and equipment, and covers operating costs for one year. The centre is then turned over to the Ministry of Education of the respective state which is then responsible for yearly operating costs.

The cost of establishing a centre and running it for the first year varies considerably between localities, depending primarily on amount of modification that is required for the workshops and the kind of tools and equipment that have to be purchased. Foundation officials use an average budget figure of £5,000 per centre. Some centres require as little as £4,000, while others run as high as £6,000. These figures do not include the cost of the foreign experts who organize the centres. Of course, once the pattern has been established, the organizing task can be taken over by local government officials.

As an illustration of the cost of establishing a centre, we reproduce below the detailed cost estimates for establishing and operating one year the centre located at Minna, in the North Western State:

Capital Expenditure:

Building conversions, provision of classroom cupboards, workbenches, blackboards, etc. and installation of electric light	609.00.00	
Equipment, tools, and tool boxes	<u>1,401.00.00</u>	
Sub-Total		£2,010.00.00

Recurrent Expenditure:

Salaries and wages	1,880.18.00	
Training materials	418.00.00	
Textbooks	143.00.00	
Trade test fees	100.00.00	
Tool kit awards	200.00.00	
Electricity charges	<u>16.10.00</u>	
	Sub-Total	£2,758.08.00
<u>Total Cost:</u>		<u>£4,768.08.00</u>

These figures are for a centre designed for four trades. It can therefore accommodate 72 students per session, and under normal operating conditions should graduate about 60 students for each ten-month period of classes. During its first year of operation it actually graduated only 52 students. But assuming a normal operating level of 60, and assuming that the initial capital cost can be spread over ten years, the outlay per student would then come to just under £50 per graduate (actually £49.7). The cost of £50 per graduate excludes the cost of administrative overhead by the Foundation and by the Nigerian Government, as well as the rental value of the shops and classrooms. Since the effect on the rate of depreciation of these facilities and opportunity costs are likely to be negligible, the facilities cost is negligible and can be ignored. Similarly, the cost of government administrative overhead that could be rationally allocated to a centre would not substantially alter the cost structure. The figure of £50 per graduate may thus be used as a reasonable approximation of local cost (i.e. exclusive of external assistance overhead).

Experience has shown that the cost per student is not substantially altered when a centre shifts from four to eight trades, so long as all the trades are different. There would be some saving in overhead if two

streams of a given trade were to use the same facilities on alternate days.

8. Economic Evaluation

The economic value of the programme is its contribution to the welfare of the country. We shall try to measure this in terms of the private gains to the trainees in the form of increased earnings and in terms of the social gains in the form of increased productivity.

These measurements present considerable difficulty, since we do not have direct evidence on the impact of training on either earnings or productivity. We shall base our calculations on the rates established by the Federal Public Service.¹ The daily rate in the relevant geographic areas for unskilled and semi-skilled workers ranges from 7s. to 11s.4d. It is unlikely that many of the trainees earn as much as 11s. a day. The rate for a Grade III artisan ranges from 13s. to 16s.10d. a day.

Once a trainee has taken the course and obtained the Grade III certificate, he can usually command the artisan rate without much difficulty. Even though there is no legal requirement on private employers to pay the rate corresponding to a particular grade, the shortage of skilled workers and pressure from organized labour, along with the possibility of government jobs, work in the artisan's favour. The certificate considerably strengthens his bargaining power, so much so that employers are often reluctant to have their workers sit for the trade tests.

In view of these facts, well informed observers are willing to assume that over time the possession of the trade certificate will raise daily

¹See 1971 Revision of Salaries and Wage Rates in the Federal Public Service (Establishment Circular No. 6 of 1971 and Treasury Circular No. A9 and B9 of 1971), Federal Ministry of Information, 1971, p. 19.

earnings by an average of five shillings. This would be roughly equal to the difference between the maximum semi-skilled and the maximum Grade III rates. It is likely also that in view of the effect of the trade certificate on the worker's bargaining power, his actual productivity will rise less than his earnings. This assumes that he was receiving less than his value in a perfect market before he was a certified artisan. The training and testing programme thus tends to have a distributional effect on income that favours the workers.

For purposes of measuring the social gains of the programme, we shall assume an increase in average daily productivity over time equivalent to three shillings, as against five shillings for the increase in individual earnings.

Ordinarily we would also assume that training will increase employment, since it can be represented as an upward shift in the demand curve for the trained labour (each worker represents more efficiency units). This direct employment effect does not apply here since all the trainees are already employed. However, the increase in the number of skilled workers may have an indirect employment effect by reducing the skill bottleneck. This positive effect on national welfare, which could be substantial in an economy like Nigeria's, is not taken into account in this evaluation of the training programme.

Since the majority of trainees are between 20 and 30 years of age, one can assume that on the average they will have at least 25 years of employment after graduation. This takes into account that some will die or become incapacitated and some may be unemployed part of the time. With the additional training their risk of unemployment is actually

reduced. We will also assume that they work 300 days a year, including overtime (government estimates are based on 313 days).

On the basis of the foregoing assumptions, the individual's gain from training and being certified is equal to an increase of £1,875 in lifetime earnings ($5s \times 300 \times 25$).

To compute the gains to society we shall use as our measure the present discounted value to the host country of the increase in productivity generated by the training centres. We shall keep our previous assumptions about the number of days worked per year and the length of the working life after graduation. The life of the initial investment in a training centre is taken to be ten years, giving us a ten-year life span for each centre. The computation of present value to the host country assumed the Foundation pays the initial investment and the first year operating costs. A discount rate of 6 per cent will be used, which is the rate used by the Central Planning Office in evaluating projects.

Once established, a centre generates 10 graduating classes. Each graduating class generates a stream of 25 annual increments in output. For a centre graduating 60 trainees, each annual increment is equivalent to £2,700 ($3s \times 60 \times 300$).

The present value (V_g) at graduation of each of the 10 streams of 25 annual increments may be expressed as follows:

$$V_g = \sum_{n=1}^{n=25} R_n (1+i)^{-n} - C \quad (1.1)$$

where $R_n = 2,700$ and represents the annual increment; C is the annual operating cost of the centre; $C = 0$ if (1.1) represents the stream

generated by the first year of the centre; $C = 3,000$ for each of the subsequent 9 streams of the centre's life.

The present value at graduation of the stream generated by the centre's first year equals:

$$\sum_{n=1}^{n=25} 2,700(1 + .06)^{-n} = \text{£}34,540$$

Each of the centre's subsequent 9 streams has a present value at graduation of:

$$\sum_{n=1}^{n=25} 2,700(1 + .06)^{-n} - 3,000$$

$$= \text{£}31,540$$

The present value (V_0) of the entire centre at its outset may be expressed as the sum of the present values of the 10 streams, each discounted to its graduation year.¹ It is expressed as follows:

$$V_0 = \sum_{m=1}^{m=10} \left[\sum_{n=25}^{n=1} R_n(1+i)^{-n} - C_m \right] (1+i)^{-m} \quad (1.2)$$

On the basis of this procedure we have obtained the following results:

1. Present value of a centre with a capacity of 60 graduates equals

¹An alternative method of computing the present value of a centre is to sum the discounted annual net returns over the working lives of all the graduates of the centre. This is expressed as:

$$V_0 = \sum_{n=35}^{n=1} (R_n - C_n)(1+i)^{-n}$$

This approach is more tedious from a computational point of view, but it is more convenient for computing the internal rate of return.

£234,038. Investment and first year cost averages £5,000.

2. Present value of the training of the 2,029 candidates passed out by the end of 1971 equals £1,065,698.

3. Present value of the training capacity installed by the end of 1971, assuming an enrolment capacity of 900 trainees, equals £3,510,570.

These results are tied to the assumption of a daily productivity increment equivalent to 3 shillings. We can remove this assumption by simply stating that for each shilling in daily productivity increase, the installed capacity in 1971 represents a present value in excess of one million pounds. This does not mean that this high rate of return to a rather modest investment could be sustained if the centres were to expand indefinitely. It is valid only to the extent that the graduates can be fully employed at their trade.

9. Concluding Observations

The role of the Ford Foundation in the development of the Vocational Improvement Centres has been to explore the most effective approaches to a felt training need and to establish pilot projects. On this experimental and developmental work, the Foundation has spent approximately £175,000 since 1965, including the salaries and support services for two expatriate project specialists. The Nigerian State governments have not only taken over the VIC's at the end of the initial year, but some states are now planning to establish additional centres on their own.

The undoubted success of this programme is attributable to a number of factors. These include:

1. A careful definition at the outset of the training problem to be solved and of its relation to other aspects of technical training.

2. Selection of training areas geared to local and regional needs to avoid training people for whom there is no job in sight.

3. Selection of a practical level of training which is geared to the needs of the local and regional labour markets.

4. Facilitating access to the training by scheduling the programme after working hours and creating a decentralized multi-centre structure. Trainees pay neither fees nor do they have to forego earnings.

5. Use of locally recruited training staff, who are familiar with local problems and requirements, and can adapt to the special needs of the trainees, especially with regard to language.

6. Structuring the programme with a visible pay-off for trainees after a reasonably short period of time, in addition to providing performance incentives. The trade tests and the tool kit prizes are significantly responsible for the good performance and low drop-out rates of the trainees.

7. Low capital requirements, low operating costs, and simple administrative structure. These factors are no doubt largely responsible for the ease of transfer of the centres to the various state governments. They do not impose a sudden and unreasonable burden on the state treasuries.

8. A flexible structure which can readily be expanded or altered as new needs in different trades become evident.

9. Selection of highly skilled project specialists who had many years of previous experience with technical education in all parts of Nigeria. Their ability and experience have prevented many false moves and cut many costs.

10. Last, and perhaps most fundamental, an exceptional readiness to cooperate on all levels of Nigerian government.

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